UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte PER-AKE LARSON and DONALD KOSSMANN

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Appeal 2016-008524
Application 13/738,503[1]
Technology Center 2100

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Before ALLEN R. MacDONALD, JOHN P. PINKERTON, and
GARTH D. BAER, *Administrative Patent Judges.*

PINKERTON, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's
Final Rejection of claims 1–20, which constitute all the claims pending in
this application. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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[1] The real party in interest identified by Appellants is Microsoft Technology
Licensing, LLC. App. Br. 3.

STATEMENT OF THE CASE

Introduction

Appellants' described and claimed invention relates generally to creating and storing "an adaptive range filter that contains a compact summary of the contents of an index for a data store in the form of a trie data structure." Abstract.[2]

Claim 1 is representative and reads as follows (with the disputed limitation *emphasized*):

> 1.   A computer-implemented process to summarize data, comprising:
>
>> creating a *trie-structure* to index the data wherein:
>>
>>> each node of the *trie-structure* represents a particular region of a domain of the data,
>>>
>>> a root node represents the whole domain of data to be indexed,
>>>
>>> each parent node fully contains the regions of its children in the *trie-structure*, and
>>>
>>> leaves of the *trie-structure* contain occupied bits indicating whether tuples in the set of data exist in the particular region of data.

App. Br. 25 (Claims App'x).

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[2] Our Decision refers to the Final Office Action mailed July 21, 2015 ("Final Act."), Appellants' Appeal Brief filed Dec. 28, 2015 ("App. Br.") and Reply Brief filed July 29, 2016 ("Reply Br."), the Examiner's Answer mailed May 16, 2016 ("Ans."), and the original Specification filed Jan. 10, 2013 ("Spec.").

Rejections on Appeal

Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe et al. (US 2013/0318126 A1; published Nov. 28, 2013) ("Graefe"), in view of Fu et al. (US 2006/0294311 A1; published Dec. 28, 2006) ("Fu").

Claims 2–4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Fu, and further in view of Yu (US 2013/0297613 A1; published Nov. 7, 2013).

Claims 7–9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Fu, in view of Yu, and further in view of Graefe (US 2011/0208704 A1; published Aug. 25, 2011) (hereinafter "Graefe '704").

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Becker (US 6,598,119 B2; issued July 22, 2003), in view of Graefe, and further in view of Fu.

Claims 10, 11, 14, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Yu.

Claims 12, 13, and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Yu, and further in view of Fu.

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Yu, and further in view of Graefe '704.

Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Yu, and further in view of Alia et al. (US 8,502,819 B1; issued Aug. 6, 2013) ("Alia").

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graefe, in view of Yu, and further in view of Wang (US 2009/0182726 A1; published July 16, 2009).

ANALYSIS

Appellants argue the cited references fail to teach or suggest a "trie-structure" as recited in independent claim 1.[3] *See* App Br. 9. More specifically, Appellants argue the Foster B-tree data structure, taught by Graefe, is different than the claimed trie data structure. *See id.* According to Appellants, as defined in Appellants' Specification, and as understood by one of ordinary skill in the art, a trie data structure is a specialized type of tree data structure where no node in the tree data structure stores a key associated with the node, and, instead, a node's position in the tree data structure defines a key with which it is associated. *See id* (citing Spec. ¶ 28). In contrast, Appellants argue, a B-tree data structure stores keys in its internal nodes. *See* App. Br. 10. Appellants further argue none of the other cited references teach or suggest a trie data structure either. *See* App. Br. 9. Further, Appellants essentially reference or repeat their argument regarding independent claim 1 for independent claims 5 and 10 and dependent claims 2–4, 6–9, and 11–20.[4] *See* App. Br. 13–24.

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[3] Appellants' arguments raise additional issues, but we do not reach them because the identified issues are dispositive of the appeal.

[4] Claim 7 depends upon claim 4, and claims 8 and 9 depend upon claim 7. *See* App. Br. 26–27 (Claims App'x). However, this appears to be in error, as claim 4 is a method claim, whereas claim 7 is a system claim. Both Appellants and the Examiner appear to treat claim 7 as depending upon claim 5, rather than claim 4. Thus, we interpret claim 7 as depending upon claim 5, rather than claim 4, and we conclude claims 7–9 are not indefinite

In response to the Examiner's position that the broadest reasonable interpretation of "trie structure" is an ordered tree data structure because Appellants fail to explicitly claim the distinguishing characteristics of a trie data structure within the claim (*see* Ans. 6–8), Appellants further argue a trie data structure is a known data structure, and thus, the characteristics of a trie data structure do not need to be recited explicitly in the claims. *See* Reply Br. 3. In further response to the Examiner's position that the claimed trie data structure is not a proper trie data structure because the claimed trie data structure does not satisfy the characteristics described in Appellants' specification (*see* Ans. 5–6, 8–9), Appellants argue the claimed trie data structure does indeed satisfy the characteristics described in Appellants' specification. *See* Reply Br. 6.

We are persuaded by Appellants' arguments. Appellants' Specification defines a "trie structure" as "an ordered tree data structure that is used to store a dynamic data set . . . [where] [n]o node in the tree stores the key associated with the node, instead, its position in the tree defines the key with which it is associated." *See* Spec. ¶ 28 (emphasis added). We agree with Appellants that Graefe's B-tree data structure does not teach the claimed "trie structure," because, in Graefe's B-tree data

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under 35 U.S.C. § 112, second paragraph, for mixing statutory classes. *See In re Katz Interactive Call Processing Patent Litigation*, 639 F.3d 1303, 1318 (Fed. Cir. 2011) (holding that a single claim that claimed both an apparatus and method steps of using the apparatus was indefinite under 35 U.S.C. § 112, second paragraph). However, should there be any further prosecution, Appellants may wish to appropriately amend claim 7 to address the claim dependency issue.

structure, the nodes stores keys (*see, e.g.*, Graefe ¶ 57 ("comparing key values stored at each node visited")), whereas, in the claimed trie data structure, no single node stores a key. The Examiner's interpretation of the claimed "trie structure" as an ordered tree data structure is not reasonable, in light of the claim language "trie structure," and in light of the definition of "trie structure" disclosed in Appellants' specification. Further, the Examiner has not persuasively established the claimed "trie structure" is somehow inconsistent with the definition of "trie structure" disclosed in Appellants' specification. We further disagree with the Examiner's position that Appellants' argument fails because the claim does not explicitly recite the feature "**no node in the tree stores the key associated with that node**" (*see* Ans. 7), as one of ordinary skill in the art would understand the claimed "trie structure," when properly interpreted in light of the specification, to include this feature.[5]

Accordingly, we do not sustain the Examiner's rejection of independent claims 1, 5, and 10 for obviousness under 35 U.S.C. § 103(a). We also do not sustain the Examiner's rejection of dependent claims 2–4, 6–9, and 11–20, which variously depend from one of the aforementioned independent claims.

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[5] For example, if an applicant's claim recited a "square surface," the applicant would not be further required to recite in the claim that the surface includes four equal sides and four equal angles (i.e., right angles).

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DECISION

We reverse the Examiner's decision rejecting claims 1–20 under 35 U.S.C. § 103(a).

<u>REVERSED</u>